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ABSTRACT

This study assesses the effects of an aural rehabilitation program, alone or in combination with information about cognitive learning style, on reducing feelings of hearing handicap by first-time hearing aid users. Subjects, 40 newly amplified hearing-impaired adults (ages 30 to 90), were pretested for conception of their hearing handicaps and individual cognitive learning style. Subjects received one of four treatments during a four-week trial period: control group (no treatment); aural rehabilitation; cognitive style disclosure; and cognitive style disclosure/aural rehabilitation. At the end of the trial period, each subject was again tested for hearing handicap perception. Test results indicated that subjects who received aural rehabilitation experienced a greater reduction in their perception of their handicap; the information provided in the cognitive style disclosures did not seem to have significant effect on the change scores. Correlation of the hearing handicap perception scores with subscale category scores of the cognitive learning style was used to measure four characteristics of cognitive style--magnitude, difference, relationship, and deduction. A positive trend was found, but there does not appear to be enough strength within any of the correlations to imply a significant relationship between any of the identified characteristics of cognitive style and the identified components of perception of hearing handicap. The text is supplemented by two tables, and a summary of the aural rehabilitation program is appended. (17 references) (EW)

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A Comparison of Instructional Intervention Strategies with Newly Amplified Hearing-Impaired Adults

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A Comparison of Instructional Intervention Strategies with Newly Amplified Hearing-Impaired Adults

Introduction

Aural rehabilitation is an area of audiology that has received the least attention and research (Alpiner, 1982a). There have been major improvements in the technological aspects of audiology, but the remediation process has remained virtually unchanged for decades. There have been efforts to identify effective and efficient means of improving benefit from hearing aids (Walden, Prosek, Montgomery, Scherr, and Jones, 1977; Walden, Erdman, Montgomery, Schwartz, and Prosek, 1981; Alpiner, 1982a). None, however, have identified an approach that seems to be consistently effective.

The lack of advancements in the rehabilitation of the hearing-impaired adult is of serious consequence. As the population ages, more adults are being diagnosed and fitted with hearing aids, but significant numbers become frustrated and stop wearing their hearing aids during the first few weeks (Alpiner, 1982a). These individuals need to be offered opportunities to adjust to and function with their new hearing aid easily and efficiently.

In many of the studies of amplification adjustment, individual differences were often cited as the reasons why any one particular training technique or combination of techniques were ineffective in decreasing the perception of hearing handicap by adults (Bode & Oyer, 1970; Walden et al., 1981). The perception of hearing handicap can best be defined as the hearing-impaired person's feelings about how well or poorly he/she functions in listening situations.

It may be that the differences among hearing-impaired adults can be explained by differences in their learning styles. Cronbach and Snow (1977) have suggested that the manner in which individuals approach information processing situations generally takes the form of patterns established early in life. These patterns or strategies are termed cognitive style, which may be important to consider when determining their individual learning styles (Garger & Guild, 1984). Research is generally in agreement that the more personalized the instruction, the faster and better the possibility of accomplishment of a given task by the individual (Murray, 1979; Fourier, 1984).

One approach to personalizing instruction and helping the individual understand the manner in which information is processed is termed cognitive style disclosure. Evidence in the literature

suggests that this approach is very effective in community college settings (Hill & Nunney, 1971; Fourier, 1984; Niles & Mustachio, 1978). It is possible that the cognitive style disclosure approach might be beneficial in the aural rehabilitation of newly amplified hearing-impaired adults.

Summary of Research Project

The purpose of this study was to identify aural rehabilitation training strategies that would significantly reduce the feeling of hearing handicap by first-time hearing aid users. An aural rehabilitation program was used composed of a brief introduction to hearing aids and the skills associated with using a hearing aid (Traynor & Smaldino, 1986) (Appendix A). This approach to aural rehabilitation, alone or in combination with information about cognitive learning style, as presented to first-time users of hearing aids. Cognitive style information was also presented to a group of new hearing aid users without including any additional components of the aural rehabilitation program.

The study involved assessing listening performance in situations both before and one month following the wearing of the new hearing aid. The prefitting inventory was used to measure the client's perception of hearing handicap. Also included was an assessment of individual cognitive learning styles.

A further question investigated in this study was to determine if there was a correlation between the subscales of the cognitive learning style inventory and the subscales of the hearing handicap inventory. This was a preliminary effort to see if there was any relationship between the presence or absence of a particular cognitive learning style and elements of a hearing handicap.

Forty newly amplified hearing-impaired adults ranging in age from 30 to 90 served as subjects in this study. They had not worn a hearing aid prior to participating in this study. Each participant completed the revised Albany Learning Style Inventory (Bosco, 1983) and the revised Hearing Performance Inventory (Lamb, Owens, Schubert, and Giolas, 1979) prior to their random assignment to a treatment group. There were four groups: Control (CG), Cognitive Style Disclosure (CSG), Aural Rehabilitation (ARG), and Cognitive Style Disclosure/Aural Rehabilitation (CS/ARG). Each subject received one of these treatments during a four-week trial period. At the end of the four-week trial, each participant completed the Hearing Performance Inventory again.

The statistical procedure used for data analysis was a two-way analysis of variance. A correlation matrix was developed to investigate the relationships between the subscales of the two inventories.

Conclusions of the Study

Perception of Hearing Handicap

The first three experimental questions were designed to identify possible alternative training procedures in the rehabilitation of newly amplified hearing impaired adults. The difference between the pretest and posttest score of the Hearing Performance Inventory were used to calculate means for the four groups studied (Table 1). The result of the two-way ANOVA suggested that the participation in aural rehabilitation did affect the perception of hearing handicap by hearing-impaired adults (Table 2).

This indicated that those subjects who had received aural rehabilitation experienced a greater reduction in their perception of their handicap than those who had not received the aural rehabilitation intervention. The information provided in the cognitive style disclosure component of the intervention procedures did not seem to have a significant effect on the change scores.

Correlation of Subscales

The difference scores between the pretest and posttest scores on the Hearing Performance Inventory were used to correlate with each of the four subscale category scores from the Albany Learning Style Inventory, the instrument used to measure characteristics of learning style. The four characteristics of cognitive style measured by this instrument were magnitude, difference, relationship, and deduction.

A Pearson product-moment correlation statistic was used to measure the relationship between the variables (Table 3). The correlations obtained a positive trend in the relationship. There does not appear, however, to be enough strength within any of the correlations to imply a significant relationship between any of the identified characteristics of cognitive style and the identified components of perception of hearing handicap.

Aural Rehabilitation

The results of this study strongly indicate that newly amplified individuals can benefit from participation in a short-term aural rehabilitation program. Those individuals who received the aural rehabilitation intervention technique indicated a significantly greater reduction in their perception of their hearing handicap on the post-treatment inventory.

This conclusion supports the position taken by those specialists within the field of audiology that newly amplified hearing-impaired adults should be provided with more than mere instruction in the operation of their new hearing aids (Alpiner, 1982a; Sanders, 1982; Giolas, 1982; Davis & Hardick, 1982). The kind of program suggested by these authorities focuses on several aspects of adjustment to amplification. Emphasizing skills related to the communication process can benefit the new hearing aid user. The preliminary impression from the statistical analysis of the data in this study indicate that participation in a program that teaches communication skills can reduce self-reported hearing handicap.

Cognitive Style Disclosure

Another finding from this study was that informing adults about their particular cognitive style did not seem to have any influence on their reported success with amplification. Telling the participants of the manner in which they process information did not influence any change in their perception of their hearing handicap. It seems that while cognitive style disclosure has been shown to be an effective approach in academic situations (Fourier, 1984; Hill & Nunney, 1971; Niles & Mustachio, 1978), it did not appear to apply to this particular non-academic situation.

The literature related to cognitive style disclosure involved academic settings, principally the community college (Fourier, 1984; Hill & Nunney, 1971; Niles & Mustachio, 1978). In those settings, the students were very aware of specific expectations required of them. It is possible that the nature of cognitive style disclosure is such that it is not applicable to other kinds of instructional situations where the expectations of the learners are less clear. It is also possible that the nature of cognitive style disclosure is applicable to these other kinds of instructional situations, but that modifications in the approach need to be made.

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Table 1

Summary Table of the Means and Standard Deviations of the Difference Scores of the Four Groups on the Hearing Performance Inventory

Group	Mean	Standard Deviation
Control	30.20	72.13
Cognitive Style Disclosure Only	41.40	57.44
Aural Rehabilitation Only	104.90	59.60
Aural Rehabilitation/Cognitive Style Disclosure	100.00	43.69

Table 2

Summary Table for the Two-Way ANOVA

Row Variable = Cognitive Style
Column Variable = Aural Rehabilitation

Row Variable: ss=99.225 DF= 1 MS=99.225 F= .047
Column Variable: ss=444.22.225 DF= 1 MS=44422.225
F=20.999*
Interaction: ss=648.025 DF= 1 MS=648.025 F= .306
Error-W: ss= 76156.9 DF=36 MS=2115.469
Total: ss=121326.375 DF= 39

* $p > .05$.

Table 3

Summary Table for the Correlation Matrix

Albany Learning Style Instrument Subscales	Difference	Magnitude	Relationship	Deduction
Hearing Performance Inventory Subscales				
Understanding Speech with Visual Cues	.184	.381	.434	.296
Understanding Speech without Visual Cues	.481	.093	.186	.113
Intensity	.301	.285	.334	.116
Response to Auditory Failure	.374	.185	.200	.089
Personal	.202	.365	.090	.379
Social	.423	.152	.235	.175

APPENDIX A

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Computerized Adult Aural Rehabilitation Program
J. Smaldino and R. Traynor
Little, Brown and Company
1986

Session 1 -- The Auditory System and How It Works.

Goals: To acquaint the client with the auditory mechanism, how it operates and specific disorders that can cause hearing losses operates.

To inform the client about the operation of and the difficulties encountered utilizing a hearing aid. Further to acquaint the client with assistive devices that may be beneficial.

Objectives:

1. Present and make sure each client understands anatomy of the ear.
2. Present and make sure each client understands the physiology of the ear.
3. Determine specific diagnosis for each client and explain the pathology in detail.
4. Describe the modifications often conducted on the hearing instruments to facilitate better communication.
5. Determine the situations in which the clients may have difficulty.

Session 2 -- Auditory Training

Goals: To simulate various types of progressively worse listening situations and teach the client coping strategies.

Objectives:

1. Listen and repeat word stimuli correctly when noise is progressively introduced in the background.
2. Listen and repeat phrase stimuli correctly when noise is progressively introduced in the background.
3. Listen and repeat sentence stimuli correctly when noise is progressively introduced in the background.
4. Listen to stories, in quiet and in noise, and correctly answer questions related to each.

Session 3 -- Speechreading

Goals: To utilize visual cues to augment communication.

Objectives:

1. Present and insure an understanding of basic rules for speechreading, i.e. keep hands away from mouth, etc.
2. Present and insure understanding of tips for effective communication.
3. Describe the structure of language.
4. Describe the predictability of language.
5. Demonstrate how the most obvious speech sounds look on the face.
6. Give assignment to turn down T.V. and watch a newscaster's face to determine the message presented.
7. Present specific lessons where client needs to watch for specific lip movements.
8. Describe and practice homophenous words.
9. Describe and practice sentences that can be predicted by certain lip movements and structure of language.
10. Describe and practice sentences that can be predicted by context and situational cues.

Session 4 -- Environmental Situations

Goals: To utilize the auditory and visual skills obtained in the previous sessions to communicate in a realistic situation.

Objectives:

1. Simulate numerous situations and conduct role play with the client in quiet.
2. Simulate numerous situations and conduct role play with the client in noise.
3. Instruct the client on the use of the telephone with the hearing aid if the client is having difficulty in that situation.
4. Assist the client in developing some strategies for coping with meeting new people.
5. Assist the client in developing some strategies for coping with large group situations.
6. Assist the client in developing some strategies for coping with difficult communication situations.